

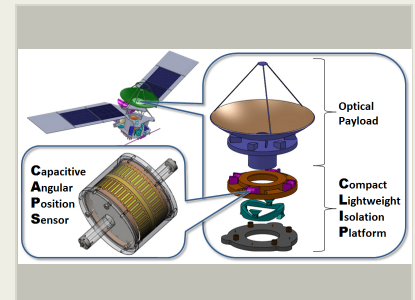
Compact, Lightweight Isolation Platform (CLIP), Phase I

Completed Technology Project (2013 - 2013)



Project Introduction

NASA has a critical need for improved bi-directional data transmission rates from a variety of spacecraft to Earth. NASA estimates that the current Mars to Earth transfer rate of 6 Mbps might be increased to 600Mbps using a laser comm (LC) system. Because the LC beam is less than 10 microradians wide and the Earth at apogee is 32 microradians wide, as seen from Mars, LC beam jitter caused by spacecraft base motion must be reduced to sub-microradian levels to enable beaconless optical beam pointing. To meet the need, NASA is seeking innovative compact, lightweight, space-qualifiable vibration isolation platforms for payloads massing between 3 and 50 kg that require less than 15 W of power and mass less than 3 kg that will attenuate an integrated angular disturbance of 150 μ r to less than 0.5 microradians (1-sigma), from <0.1 Hz to ~500 Hz. ATA has a long track record of producing stabilized platforms to host small optical payloads. Building on a previous NASA SBIR, ATA now produces the stable platform used in NASA's LLST and LCRD programs. ATA will create a Compact, Lightweight Isolation Platform (CLIP) that could host the LC collimator telescope and provide a stabilized platform to prevent the 150-microradian spacecraft disturbance environment from reaching the LC terminal. Advances in the suspension flexure, the platform structure, and actuators will be required to meet the size, weight and power requirements. One challenging requirement is that an angular-motion sensor is required for the control system. Gyros exist that can measure adequately but they are too heavy, too large, and use too much power. ATA will develop a small, lightweight, nanoradian-class angular noise Capacitive Angular Position Sensor (CAPS). The sensor will have low power and high reliability, which ATA will demonstrate by producing TRL 4 prototypes in Phase I. ATA will develop the CLIP, a 0.5 microradian residual motion stable platform, in Phase II for programs like iROC.



Compact, Lightweight Isolation Platform (CLIP)

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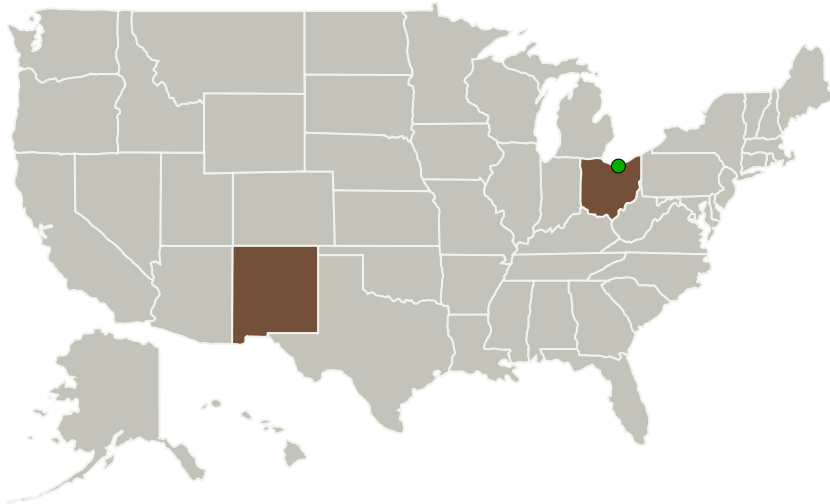
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Applied Technology Associates	Lead Organization	Industry	Albuquerque, New Mexico
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

New Mexico	Ohio
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Project Transitions

▶ **May 2013:** Project Start

✓ **November 2013:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140424>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Applied Technology Associates

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

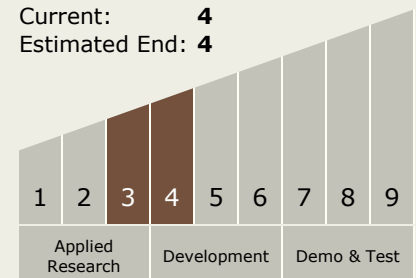
Carlos Torrez

Principal Investigator:

Rick Walter

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**

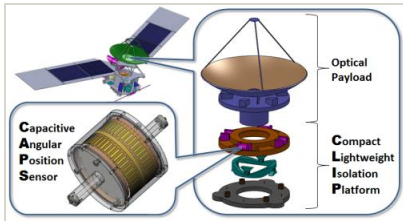


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Images



Project Image

Compact, Lightweight Isolation Platform (CLIP)

(<https://techport.nasa.gov/image/132922>)

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.5 Revolutionary Communications Technologies
 - └ TX05.5.3 Hybrid Radio and Optical Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System